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NEW TRENDS IN THE ECOLOGICAL AND BIOLOGICAL RESEARCH

International scientific conference

Book of Abstracts

9. – 11. September, 2015

University of Prešov, Slovak republic

Organizer:

University of Prešov
Faculty of Humanities and Natural Sciences
Greek-Catholic Theological Faculty
Faculty of Orthodox Theology



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Analysis of modern safe methods of drinking water disinfection

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Abstract

Since water is the factor without which human life is impossible, its high quality must be a priority of every state. This is especially true for quality by sanitary-hygienic indicators, which are provided by disinfection. The deviation from limit values of such indicators can cause serious outbreaks of infectious and intestinal diseases. However, one may not ignore the sanitary-chemical indicators, which can also have a negative impact on human health.

There are many methods of drinking water disinfection, but a lot of them have great disadvantages. For example, the usage of chlorine, sodium hypochlorite or chloramine is accompanied by the formation of toxic and carcinogenic by-products – organochlorine compounds. Ozonation requires extremely high investment and is accompanied by the formation of mutagenic and toxic products as well. Ultraviolet is ineffective against some viruses. Besides, ozonation, ultraviolet light and ultrasound do not provide aftereffect. This may result in recontamination during the water supplying to the consumer. The usage of silver can cause its accumulation in the human body and some diseases as heavy metal. Moreover, it is proved that the silver ions do not affect on spore-forming bacteria. Thus, such alternative methods of drinking water disinfection as the usage of chlorine dioxide or oxidants mixtures recently started to be implemented in the world. Consequently, their thorough analysis is the aim of this study.

Such alternative methods of drinking water disinfection as the usage of chlorine dioxide or oxidants mixtures can be recommended for the safe water treatment. Their main advantages are much fewer or no formation of toxic and carcinogenic by-products (trihalomethanes and haloacetic acids), removal of biofilms from water supply pipes, stronger disinfectant properties and availability, and safety of necessary substances (salt for oxidants mixture producing, and sodium chlorite and hydrochloric acid for chlorine dioxide producing). However, before usage of chlorine dioxide one should research the methods of by-products extracting (chlorates and chlorites) from drinking water.

Keywords: *disinfection, organochlorine compounds, chlorine dioxide, a mixture of oxidants, biofilm*